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SUBJECT: Forwards response to 980504 telcon RAI re proposed changes to control room air temp treatment sys TS.

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May 21, 1998
NMP1L 1320

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

RE: Nine Mile Point Unit 1
Docket No. 50-220
DPR-63

SUBJECT: RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION RELATED TO PROPOSED CHANGES TO THE TECHNICAL SPECIFICATIONS FOR THE CONTROL ROOM AIR TREATMENT SYSTEM

Gentlemen:

By letter (NMP1L 1312), dated May 2, 1998, Niagara Mohawk Power Corporation (NMPC) transmitted an Application for Emergency Amendment to the Nine Mile Point Unit 1 (NMP1) Technical Specifications (TS) as set forth in Appendix A of Operating License DPR-63. The application contains proposed changes to Sections 3.6.2 and 4.6.2, "Reactor Protection," to incorporate modifications to the initiation circuitry for the Control Room Air Treatment System. The proposed changes remove the high radiation signal from TS Tables 3.6.2l and 4.6.2l, "Control Room Air Treatment System Initiation," and add Reactor Protection System (RPS) main steam line high flow, main steam line tunnel high temperature, high drywell pressure, and low-low reactor vessel water level signals to the initiation circuitry for the Control Room Air Treatment System.

On May 4, 1998, a conference call was held with the NRC Staff (Staff) concerning the emergency amendment application. During the conference call, the Staff requested a more detailed description of the problem which prompted the emergency amendment application. Enclosed as Attachment A is an expanded description of the problem that was previously described in Attachment E of the emergency amendment application.

Subsequent to the May 4, 1998 conference call, additional information was requested. Attachment B provides a restatement of each of the seven items of information provided, followed by the NMPC response.

Very truly yours,

John H. Mueller
Chief Nuclear Officer

JHM/CDM/kap
Attachments

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# ATTACHMENT A

## NIAGARA MOHAWK POWER CORPORATION
## LICENSE NO. DPR-63
## DOCKET NO. 50-220

### Expanded Problem Description

Currently, Nine Mile Point Unit 1 (NMP1) is in a shutdown condition due to the inoperability of the Control Room Air Treatment System (also known as the control room emergency ventilation system). The events that led to the current situation for NMP1 began during a design review of the NMP1 control room emergency ventilation system which was prompted by recent operating experience information provided by Nine Mile Point Unit 2 (NMP2). On March 28, 1998, following a partial loss of offsite power at NMP2, it was discovered that the design of the NMP2 ventilation filters actuation logic incorporates a time delay feature that was not previously recognized. Due to the questioning attitude of the Niagara Mohawk Power Corporation (NMPC) staff, the design of the NMP1 control room emergency ventilation system was reviewed to determine if a similar condition existed at NMP1. As a result of this review, the following two findings were made concerning NMP1:

1. Contrary to a 1984 commitment, the Control Room Air Treatment System would not automatically initiate during a Main Steam Line Break (MSLB).

2. Initiation of the Control Room Air Treatment System at the current radiation monitor setpoint of $\leq$1000 counts per minute (cpm), as stated in Technical Specification (TS) Table 3.6.2l, is not sufficient for compliance with 10 CFR 50, Appendix A, General Design Criterion (GDC) 19 limits for radiological protection of the control room operators.

A control room habitability study summary report to address TMI Action Plan Item III.D.3.4 was submitted to the NRC Staff (Staff) on January 31, 1984. The study concluded that GDC 19 dose limits would be met during a Loss of Coolant Accident (LOCA), but the doses resulting from a MSLB would be slightly higher than the GDC 19 dose limits.

The January 31, 1984 submittal was revised and resubmitted to the Staff on March 19, 1984 to address a revision to the MSLB evaluation. Changes to the calculation included using the TS reactor water activity limit of 25 microcuries/gram ($\mu$Ci/g) total iodine in the reactor coolant instead of 30 $\mu$Ci/g, and an atmospheric diffusion estimate (X/Q) of 1.93E-03 sec/m$^3$ instead of 8.29E-03 sec/m$^3$. Using these revised parameters, the doses from the MSLB were less than the GDC 19 dose limits.

Both the January 31, 1984 and the March 19, 1984 submittals stated that control room emergency ventilation is assumed to be automatically actuated at the onset of both a MSLB and

LOCA. It was also stated that modifications to the control room ventilation system would provide this capability. In the Safety Evaluation Report issued for closure of TMI Action Plan Item III.D.3.4, dated May 21, 1984, the Staff acknowledged that NMPC had committed in a March 28, 1983 letter to make modifications which included the installation of redundant radiation monitors in the normal control room ventilation intake. The Safety Evaluation stated that the radiation monitors are to provide a signal to automatically isolate the normal control room ventilation intake and initiate the emergency ventilation system. A calculation had been performed in February, 1984 to establish a setpoint for the radiation monitors such that they would provide automatic initiation of the emergency ventilation system. The individual who performed the calculation assumed the MSLB to be the bounding accident and established the current TS setpoint of 1000 cpm based on the analytical results of the calculation.

On April 21, 1998, it was discovered that the radiation monitor setpoint was too high to detect a MSLB. Consequently, automatic initiation of the control room emergency ventilation would not have occurred for a MSLB. Moreover, no evidence was found of an evaluation of the radiation monitor setpoint relative to a LOCA. Subsequent calculations showed that a lower setpoint (approximately 210 cpm) would be required to detect and initiate the control room emergency ventilation system for the spectrum of MSLB conditions that could exceed GDC 19 limits without filtration. Calculations also showed that the existing radiation monitors could not be set to detect LOCAs. Therefore, the GDC 19 dose limits could not be met for a LOCA.

Following the discovery that the radiation monitors were set too high to detect a MSLB, the Control Room Air Treatment System was declared inoperable and TS Limiting Condition for Operation (LCO) 3.4.5 was entered. The LCO requires that the system be restored to operable status within seven days or initiate a reactor shutdown and achieve cold shutdown conditions within the following 36 hours.

During the seven-day out-of-service time, intensive efforts took place to identify possible analytical or hardware solutions to allow restoration of the Control Room Air Treatment System to operable status. Based upon the results of an engineering design review, it was concluded that modifications to the Control Room Air Treatment System initiation circuitry would be necessary. Because the modifications would affect the Reactor Protection System (RPS), it was decided to perform the modifications in a shutdown condition. As a result, a plant shutdown was initiated at 0505 hours on April 28, 1998.

The proposed design to correct the Control Room Air Treatment System design deficiencies will provide automatic initiation of the system at the onset of both a MSLB and LOCA. Spare contacts from the RPS logic circuits will be used to provide the initiation signals. Specifically, MSLB automatic initiation of the system will be on main steam line high flow or main steam line tunnel high temperature and LOCA automatic initiation of the system will be on high drywell pressure or low-low reactor vessel water level. Automatic initiation on high radiation will be retained in the design; and the radiation monitor setpoint will be reduced.

The control room ventilation intake radiation monitors are in-line gas monitors. The required setpoint of the monitors is so close to the monitor sensitivity that spurious actuations may occur. Because of this problem, for postulated accidents, except the MSLB, the monitors cannot be calibrated to provide proper response. For this reason, NMPC has proposed to initiate the Control Room Air Treatment System using RPS signals. In addition, because automatic initiation on a radiation monitor signal is no longer required to meet GDC 19 dose limits, the function and its associated surveillance requirements are being removed from the TS. Since the parameters required for initiation of the Control Room Air Treatment System are listed in TS Tables 3.6.2l and 4.6.2l (currently only the "High Radiation Ventilation Intake" parameter is listed), a TS amendment to revise this list is required prior to declaring the system operable. By letter (NMP1L 1312), dated May 2, 1998, NMPC transmitted an application for emergency amendment to the NMP1 TS requesting the necessary changes. NMP1 is prevented from resuming operation until such time that the proposed amendment is approved.

ATTACHMENT B

NIAGARA MOHAWK POWER CORPORATION
LICENSE NO. DPR-63
DOCKET NO. 50-220

NRC Request for Additional Information and
Niagara Mohawk Power Corporation (NMPC) Responses

*Request for Information #1*

*[Provide a r]eference to the dose assessment or transmittal of the dose assessment which indicates operation of the control room ESF ventilation system is required in the event of a Fuel Handling Accident.*

Required Response #1

The dose assessment calculation for the NMP1 Fuel Handling Accident will be transmitted for your review under separate cover.

*Request for Information #2*

*[Provide the] MSLB and LOCA control room dose calculations.*

Required Response #2

The dose assessment calculations for the MSLB and LOCA will be transmitted for your review under separate cover.

*Request for Information #3*

*Explain why the LOCA analysis assumes a leakage rate of 1.1% by weight of containment air per day when the TS allowable leakage rate (<1.5% by weight) could be greater.*

Required Response #3

At NMP1, the primary containment post accident leakage rate of 1.9 weight percent per day at 35 psig is the allowable leakage consisting of steam, moisture, water vapor, noble gasses, nitrogen, hot air devoid of oxygen, et. al. at 35 psig. The current TS Bases state that the 1.5 weight percent per day at 35 psig ($L_A$) is a ratio (0.8) of the 1.9 weight percent per day at 35 psig of the post accident atmosphere compared to the test condition atmosphere (dry-air mass). Until 1997, NMP1 conducted the Containment Integrated Leak Rate Test (CILRT) at the reduced pressure of 22 psig.

NUREG 0737 states that Standard Review Plan (SRP) 15.6.5 should be used to analyze the radiological consequences for control room habitability. SRP 15.6.5 states that "The leakage rate used should correspond to that given in the technical specifications." In 1984, the TS Maximum Allowable Leak Rate was 1.1 weight percent per day at 22 psig [$L_T$ (22)]. $L_T$ (22) is equivalent to $L_A$ based on the dry-air mass of the containment, corrected for the difference in pressures. The term $L_A$ was not defined in the TS in 1984.

The more appropriate term for use in the current radiological calculations is $L_A$ (1.5 weight percent per day at 35 psig); which is the current TS Maximum Allowable Leak Rate, although $L_A$ and $L_T$ are equivalent. The dose assessment calculation for the LOCA that will be transmitted for your review per Item 2 above will use $L_A$.

*Request for Information #4*

*What is the basis for the MSIV leakage number?*

Required Response #4

Leakage is calculated using the latest 10CFR50 Appendix J Types B and C test results for selected penetrations. The penetrations considered are the Main Steam lines (2), the Feedwater Lines (2), the Emergency Cooling Steam Supply and Water Return Lines (4), the Drywell Vent Line (1) and Torus Vent Line (1), and the Main Steam and Feedwater penetration bellows assemblies. The Vent Lines are included, since the capability exists to vent the lines to the main condenser.

The administrative limit for leakage was established based on a radiological calculation to ensure control room habitability. The leakage limit is presently 42.000 SCFH @ $P_A$ (35 psig) with an individual valve Inservice Test (IST) and 10CFR50 Appendix J Testing Program Plan limit of 32.3 SCFH @ $P_A$. Secondary Containment bypass leakage is not an NMP1 Technical Specification requirement.

*Requested for Information #5*

*Provide the historical results of leakage testing of the MSIVs.*

**Required Response #5**

**Main Steam Penetration X-2A**

MSIV 01-01 (Inboard):

| | | |
|---|---|---|
| 1989 | 17 SCFH | As-Found |
| 1989 | 7.960 SCFH | As-Left |
| 2/14/91 | 1.686 SCFH | As-Found |
| 2/21/93 | 3.706 SCFH | As-Found |
| 3/16/95 | 4.400 SCFH | As-Found |
| 3/27/97 | 3.371 SCFH | As-Found |

MSIV 01-03 (Outboard):

| | | |
|---|---|---|
| 1989 | 47 SCFH | As-Found |
| 1989 | 1.780 SCFH | As-Left |
| 2/14/91 | 2.190 SCFH | As-Found |
| 2/21/93 | 5.980 SCFH | As-Found |
| 3/23/93 | 1.350 SCFH | As-Found |
| 2/16/95 | Un-quantified | As-Found |
| 3/17/95 | 7.160 SCFH | As-Left |
| 3/28/97 | 5.350 SCFH | As-Found |

**Main Steam Penetration X-2B**

MSIV 01-02 (Inboard):

| | | |
|---|---|---|
| 1989 | 11.8 SCFH | As-Found |
| 1989 | 7.000 SCFH | As-Left |
| 1/91 | Un-quantified | As-Found |
| 1/5/91 | 0.528 SCFH | As-Left |
| 2/21/93 | Un-quantified | As-Found |
| 3/12/93 | 1.460 SCFH | As-Left |
| 3/17/95 | 1.910 SCFH | As-Found |
| 3/29/97 | 0.121 SCFH | As-Found |

MSIV 01-04 (Outboard):

| | | |
|---|---|---|
| 1989 | 74.3 SCFH | As-Found |
| 1989 | 1.150 SCFH | As-Left |
| 1/91 | 22.000 | As-Found |
| 1/5/91 | 3.580 SCFH | As-Left |
| 3/9/93 | 60 SCFH | As-Found |
| 4/1/93 | 3.530 SCFH | As-Left |
| 3/12/95 | 2.470 SCFH | As-Found |
| 3/9/97 | Un-quantified | As-Found |
| 3/25/97 | 0.083 SCFH | As-Left |

*Request for Information #6*

*What is the fraction of the break flow associated with the LOCA that bypasses the suppression pool?*

Required Response #6

In the previous LOCA analysis, no credit was taken for scrubbing in the suppression pool. Therefore, for the purpose of radiological analysis, 100% of the break flow was conservatively assumed to bypass the suppression pool. In the revised analysis, to be transmitted per Item 2 above, 2% of the break flow is assumed to bypass the suppression pool. The 2% bypass flow was conservatively derived based on the maximum allowable leakage between the drywell and suppression chamber in accordance with TS 4.3.6.b(4).

*Request for Information #7*

*While it is understood that the design basis of the reactor building emergency ventilation system is to remove one volume per day, it would be anticipated that one would take the free air volume of the reactor building, based upon that volume determine the appropriate fan flow rate. In the LOCA analysis which was provided the licensee determined the reactor building volume using fan capacity. That seems inappropriate because the fan velocity is dependent upon the fan curve and the fan may be over or under designed.*

Required Response #7

NMPC concurs with the NRC assessment that it was inappropriate to have calculated the reactor building volume using fan capacity. The dose assessment calculation for the LOCA that will be transmitted for your review per Item 2 above will use the calculated free volume of the reactor building.